NASA Student and Educator Research Program at Goddard Institute for Space Studies

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THIS WEEK AT ICP!

INSIDE THIS ISSUE:

Message from the Director

- The Institute on Climate and Planets (ICP) was created in 1994 to involve New York City students and teachers in NASA's climate change research program. ICP draws underrepresented minorities into our science community and reaches out to their schools with research education activities.

- In the 2002 Summer Institute ICP welcomes 40 students and 15 faculty from New York City area junior highs, high schools, and colleges as NASA Research Fellows at the Goddard Institute for Space Studies. As many as 17 GISS researchers contribute their time and expertise to collaborating on climate research with these students and educators.

Carolyn Harris, ICP Director

WB11 NEW YORK METEOROLOGIST "MR.G" ADDRESSES ICP

As part of ICP's Science and Society Seminar series, on Monday, July 15, 2002, ICP students, faculty, and scientists were given the opportunity to hear the popular weathercaster "Mr. G" (Irv Gikofsky) speak about reporting the weather and how he broke into his profession from teaching. Mr. G reports the weather forecast on the "WB11 News at Ten," which airs nightly on WPIX-Channel 11 in the New York Metropolitan area.

Mr. G. started his lecture off on a lighter note, telling us that he "works 10 hours a year" (that is, because he is only on the air giving weather forecasts for 2 – 3 minutes a day). However, between his trip to NASA's Goddard Institute for Space Studies to speak to us, the time he would spend speaking to us and his ride back to the WB11 studios, this was "four months of work" for him. However, in reality, Mr. G. is a very busy man who does a radio show, community work, and who spends time in the studio deciding how to best present the weather forecast to his viewers.

He reminisced back to the days when he decided to leave teaching in a Bronx junior high school to pursue a career in weather forecasting. He was "discovered" as a teacher in his class in September, 1977, when WCBS-Channel 2 did a story featuring his class.

Weathercaster Irv Gikofsky (Mr. G) pictured with graphics assistant Joe Punday and a group of ICP students

From then on he has been using his gifts to deliver weather forecasts to his viewers. His gifts, as he describes them are "to make [the weather] interesting to the folks at home." The reason why he can do this is because he has, in his own words a "passion for what I do." He also has "spontaneity" and is "ferociously loyal to his audience." He also feels well-suited for what he does because "the crazier it gets, the more normal my brain gets." Mr. G. feels that his business, as much as he enjoys it, "lacks humility." This is because, according to Mr. G. that "we are not as good as we think we are." The news business is "the most powerful business in the world," he cautioned, and as a result, that power must be exercised cautiously. His advice: we should always admit what we don't know. That's what he tries to do in reporting the weather every night.

Mr. G. had this advice for ICP students: "live your life with passion, and if you do that, from there everything flows naturally." Mr. G. was so impressed with ICP that he decided to form

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THE ICP RESEARCH AND EDUCATION CONFERENCE

The ICP Research and Education Final Conference took place on Wednesday, July 31st at Columbia University. Over 250 people attended the event, including influential individuals from NASA, and SGT, Inc, as well as corporate and government officials. The remainder of the audience consisted of teachers, school administrators, students, parents, and ICP alumni. For the students, teachers, and scientists who participated in the summer high school and college apprenticeship program, this was a forum for them to present the results of the problems that they studied related to climate and climate change. ICP participants gave PowerPoint presentations on such research areas as "Climate Impacts in New York City: Sea Level Rise and Coastal Floods", "Aerosols & Health: Environmental Linkages to Asthma", "Modeling the World Ocean for Climate Prediction", "Energy Choices for the 21st Century", "Global Methane Emissions: Assessing Historical Trends and Future Scenarios", "Storms & Climate Warming: Changes in Intensity, Rainfall and Damages", and "Climate & Carbon: Studying Carbon Sequestration in NY's Black Rock Forest." Many of our distinguished visitors were "pleasantly surprised" by the quality of the ICP research presentations, in terms of their breadth, depth, and their contribution to NASA's Earth Science research projects.

In addition, everyone was very interested in keynote speaker Dr. Jeffrey Sachs' Science and Society Address. Dr. Sachs, the director of Columbia University's Earth Institute, and a research associate for the National Bureau on economic research, delivered a talk linking the problems facing economists to how

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MR. G VISITS ICP…(CONT'D)

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a partnership between ICP and WB11, which was announced at our Final Conference. "I felt like I wasn't doing enough, so I felt that by giving the program some exposure I would be doing something beneficial," said Mr. G. As a result of this partnership, people will be able to see ICP research on the WB11 website, and information about ICP and its impact on students will be printed in newspapers owned by Tribune Corporation.

The group also heard from Joe Punday, who is a self-proclaimed "weather geek" responsible for much of the graphics work that goes on behind the scenes to report the weather. The greatest part of Punday's job, in his opinion, is that "If I'm wrong, I don't get blamed." Mr. G. brought him along to give him some recognition, as well as to show the ICP audience that "who you pick" to be assistants, supervisors, friends, etc. can lead to one's success or failure in an endeavor.

Professor Jim Witt accompanied Gikofsky and Punday as well.

Gikofsky during his lecture. He is introducing his graphics man, Joe Punday.

Prof. Witt taught space science for three years in the 1960s, and created a space science curriculum with NASA to teach at Columbia. One day, he decided that "space science gets me too upset" so he concluded that he should teach atmospheric science instead. He eventually became Gikofsky's teacher. Witt specializes in long-range forecasts – forecasts for next year and beyond. Witt's hypothesis is that there is a link between the cyclical nature of the moon and our weather, and thus, by analyzing this information, using a computer program, one can predict a future day's weather at least six months away using information from the past. His forecasts are "82% accurate." Witt's advice: "don't be fearful" of others who don't believe you – just do what makes you happy.

All in all, the students were very interested in Mr. G's remarks, and many students felt that he was a great speaker. Students felt very fortunate to have had the opportunity to see Mr. G. At the end of his lecture, many of the students surrounded Mr. G in an attempt to get his autograph. "This was great," said one faculty member. Everyone learned something about the weather and the media, bringing ICP participants further to the goal of better understanding the interaction and intersections between science and society.

"Mr. G. had this advice for ICP students: "live your life with passion, and if you do that, from there everything flows naturally."

FINAL CONFERENCE…(CONT'D)

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he hopes science will help society solve those problems. He touched upon global issues such as Earth's continually growing population and eradicating health issues such as AIDS and malaria. He examined these issues in a social and economic context, demonstrating the disparities between the world's wealthiest and poorest inhabitants. His remarks demonstrated how the physical sciences, the biological sciences and the social sciences interrelate.

Conference attendees also had the chance to hear from other speakers in the science and/or communications field. Irv Gikofsky, WB11's "Mr. G" announced a new partnership between ICP and WB11. Dr. James Harrington, who is the program manager for NASA's Minority Undergraduate Space Interdisciplinary Network (MU-SPIN) spoke about the need for mathematics and science to be taught in such a way in a child's early years so that they may

Dr. Barbara Carlson addresses the students, faculty, scientists, and invited guests who attended the UrbanMAAP Team's presentation. Behind her are the student presenters.

Students pose for a picture with Mr. Irv Gikofsky (Mr. G), his graphics assistant Joe Punday, Dr. James Harrington, MUSPIN program manager, and Dr. James Hansen, head of GISS.

be equipped with the tools that they will need to pursue careers in the Earth and space sciences. Dr. Leon Johnson from CUNY's Medgar Evers College addressed the need for funding for minority outreach programs and the future consequences that would result from a removal of such funding. Dr. Franco Einaudi, Director of the Earth Science Directorate at NASA Goddard Space Flight Center, as well as Dr. James Hansen, head of NASA Goddard Institute for Space Studies addressed the audience of students, faculty, scientists, and government representatives. Finally, alumni, many of whom are in science and/or engineering related fields, delivered short messages telling us what ICP meant to them and how it impacted their career paths. All in all, it was a very well-planned and well-attended event. The results delivered were scientifically sound and enlightening, educating the public about climate change issues.

RESEARCH TEAMS AT ICP

There are seven ICP research teams that carried out research this summer. They are: the Alternative Scenario Team, the Methane Team, the Climate Impacts Team, the Clouds Team, the UrbanMAAP Team, the Oceans team, and the Carbon Team. Each team studies a piece of the puzzle that makes up climate. In this final issue of *This Week at ICP*, we will focus on all but the first two, which were featured previously.

The Clouds Team is made up of four high school students, two faculty members and three scientists. Their goal is to examine how clouds have changed as a result from global warming over the last 20 years, and to examine how global warming will influence future storms. Their research this summer focuses on the U.S. Northeast and Midwest regions. The Northeast was chosen because it represents an extremely urbanized area, while the Midwest was chosen because it is mainly an agricultural region. Shaynah Browne and Keith Morancie examined the dollar amounts of damage done in both regions and compared them. Zelma Ortiz and Amelia Prasad looked at how precipitation patterns have changed in those regions. Ali Mirza looked for changes in cloud properties, including whether the number of rainmaking clouds in each region increased or decreased, and in what region. Preliminary results indicate that 1998 was the highest year in terms of storm damage, and in terms of flooding and winds, the period from 1993 - 2001 in the Midwest was the worst. This research is significant because of its links to economics, and thus its links to economic policy in the United States in terms of disaster relief and flood insurance.

The Oceans Team is made up of three high school students, two college students, two teachers, and two scientists. Their team studies one of the most complex problems at NASA Goddard Institute for Space Studies: how to make the General Circulation Model (GCM) better so that it can better simulate both current and future climate. It is complex because of the skills and the background knowledge required to successfully carry out the study. According to college student Akinwale Olaleye, "every student on my team must write a program in FORTRAN. There is a lot that they have to learn." The GCM is a mathematical tool with physics equations used to simulate the interrelationships in the complex climate system. The Oceans Team this year is examining two coupled ocean-atmosphere models in a validation study. To accomplish their goal, they look at model diagnostics such as sea surface temperature, sea level pressure, and temperatures in the deep ocean. They focus more on the ocean rather than the atmosphere. Jason Van Sluytman, a graduate student on the team, says that he "takes it like any other job – you got to do what you got to do." Teacher Meghan Conk feels that "if the model is good, we can learn what could happen in the future. We could then use this information to better understand how

Climate Impacts Team using beach profiling apparatus to obtain a profile of Rockaway Beach

to mitigate the effects of climate change."

The Climate Impacts Team is composed of four high school students, one college student, two faculty, and two scientists. The Impacts team is the newest team at ICP, an outgrowth of research carried out at the Bronx High School of Science by Mitch Fox, an atmospheric science teacher. The Impacts team focuses on the direct consequences of climate change to the New York City metropolitan area, with case study regions in Lower Manhattan, the Rockaways, New York, and the Jamaica Bay Wildlife Refuge. These regions were chosen because they represent the diverse types of communities that exist in New York City. The team first carried out a statistical analysis of past storms that hit the study area, in an effort to find out what the most severe storms over the last 40 or so years were like in terms of their tracks, intensities, and rainfall. Then, this information was used with projections from the GISS General Circulation Model to predict the effect of a truly severe and unlikely storm event (a storm that has a probability of occulting only once in one hundred years) on flood heights in the region. Results demonstrate severe flooding that could be disastrous to transportation networks, infrastructure, and the economy would occur in each of the case study regions. To enable them to better understand the regions of study themselves, the team members took field trips to these regions accompanied by scientists. It is hoped that policy makers will eventually begin to plan solutions to the problems uncovered in their analysis.

The Urban Measurement of Aerosols and Asthma Program (UrbanMAAP) team is made up of four high school students, one teacher, and two scientists. This team studies asthma and their relationship to aerosols. They do this using a very hands-on approach. One part of research this year includes an analysis of a survey in order to find out actual levels of asthma prevalence in various places. These surveys are conducted in public high schools in different parts of the United States. The first survey done by Urban MAAP was in 2000 and has continued to the present. Urban MAAP high school survey data helped to look at the factors that contribute to the occurrence of asthma. Demographic characteristics that influence asthma prevalence such as race, gender, allergies, other family members with asthma, and socioeconomic proxies such as type of school lunch, parents' education, and type of medical treatment a student receives have been analyzed. As an indicator of asthma management, asthma burden, the number of asthma attacks an asthmatic has, was considered in the study. By looking at asthma demographics in this and future studied analysis might be useful in order to solve US

Autumn Anderson (UrbanMAAP) uses the sunphotometer to measure ground-level ozone.

as well as global major problem of asthma. The other problem UrbanMAAP students study are aerosols and ozone on the ground level that could trigger asthma. They do this using a device called the sunphotometer, which the students assemble themselves. The team eventually hopes to make this device more accurate and reliable.

The Carbon Team is the largest team here at ICP. Composed of seven high school students, four teachers and one scientist, it is also the most

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"If the model is good, we can learn what could happen in the future. We could then use this information to better understand how to mitigate the effects of climate change."

REFLECTIONS ON ICP'S FINAL WEEK

"The common link between these projects is that they all look to bring ICP research into the classroom. In this way, ICP has the potential to impact thousands of students in the New York City public school system."

On Friday, August 2nd, 2002, offices were cleaned out, keys were turned in, and goodbyes were said as the Institute on Climate and Planets ended its ninth Summer Research Institute. It was, on the one hand, a happy occasion that featured students and faculty giving their perspectives on the summer research experience. They were also treated to a humorous and creative slide show that captured five weeks of their hard work, dedication, and fun - giving all involved in ICP something to remember, as they embark on their future journeys. This final day was also somewhat somber, because we all realized that this day may have marked the end of ICP. This is because NASA will not fund the program any longer. Without the program, NASA and the science and technology sector in general will lose a significant amount of minority students who may have entered scientific professions had they been exposed to them through experiences such as ICP. It also means that our community of young people here at GISS will no longer be able to grow and flourish. This leaves ICP director Carolyn A. Harris, who has devoted everything she has to this program over the last nine years, only four months to find new sources of funding, if the program is to continue beyond this summer. In spite of this, we all have to remain hopeful for ICP's future.

Students Anna Ruvinskaya and Lydie Louis speak to each other over food about the good times they shared at ICP

Faculty Projects

As students returned Thursday and Friday after the Final Conference to complete their research papers, faculty returned to complete their faculty projects. For example, Mitch Fox did a project that incorporated much of his research findings regarding sea level rise and coastal flooding into a Power Point presentation that students will use to fulfill a lab requirement in his atmospheric science class. He hopes to use it to motivate his students to do independent research on pressing problems related to climate change. Heather McGeory prepared an educational research study about ICP's impact on its female participants. Umit Kenis and Leila Woolley have been working on a web-based student centered activity for his Earth Science class, where the students will have the opportunity to analyze the effects of global warming, CO2 emissions and greenhouse gases and make their own projections into the future about climate change. Kenis' activity will also include a component that allows the students to evaluate the current public policies and to recommend, based on their research, new public policies. He has developed the activity in such a way that it can be used with or without Internet access, or even access to a computer. Harvey Augenbraun has been working on an interactive methane module that he uses with his 8th grade students. It teaches the students about the greenhouse effect, incorporating information from Dr. Sam Borenstein's energy model. It also allows the students to see what has been happening to methane in the atmosphere. The common link between these projects is that they all look to bring ICP research into the classroom. In this way, ICP has the potential to impact thousands of students in the New York City public school system.

Teacher Mitch Fox working on his Web Quest Activity with Student Marquise McGraw.

Community Outreach

In addition to all of this, we must not forget ICP's commitment to the surrounding community. To this end, Teresa Smith, a paraprofessional at Junior High School #8 who works with the summer institute, has taken on a new role as Coordinator of Community Service for ICP's Earth Quest program. She joins current coordinator Marquise McGraw (who revived the program and ran it in May 2002) in an effort to demonstrate how important it is that younger youth in middle school are exposed to the possibilities in science-based careers. Teresa will be working with ICP students and other students on service learning, whereby participants may be able to receive academic and community service credit for their experiences. On Thursday, August 1st, a contingent of ICP community service students went to Cornell University Cooperative Extension's New York City (CUCE-NYC) programs office to discuss the feasibility of a partnership between their 4-H program and ICP. So far, CUCE-NYC has been very helpful to us in terms of providing possible sources of student facilitators and youth participants.

ICP participants at Cornell University Cooperative Extension New York City offices in an effort to create a partnership with their 4-H program for community outreach.

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"It is this type of closely knit community that truly has the potential to make a substantial impact on the world, and to do great things within it. It is the individuals in this type of group that will become the leaders of tomorrow."

RESEARCH TEAMS…(CONT'D)

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physically active team at ICP. Each morning, the team takes an hour drive from GISS to Black Rock Forest, about one hour north of New York City. There, team members identify trees and sample soil. One of the key contributors to climate change is carbon. However, based on certain projections, there should be more carbon in the atmosphere than there already is. Thus, the question becomes where is the missing carbon? One hypothesis is that temperate forests are taking carbon out of the atmosphere. Since we have a temperate forest (Black Rock) right in our own backyard, Pat Cushing, a doctoral student at Columbia, and Don Overly, a high school teacher, have created a research program to enable students to collect data to help scientists investigate this hypothesis. The students accomplish this by first measuring the height, volume, and recording the type of trees that they find in the forest. Then, they use equations to find out how much carbon is in the trees. The other part of their investigation includes digging soil pits, identifying the horizons (layers) in the soil, taking the samples back to the lab, and analyzing them to discover how much carbon is in the soil. Eventually, this will provide a source of data useful to scientists who want to answer the question "where did all of that carbon go?"

Carbon Team Members hard at work out in Black Rock Forest

As one can see, the ICP teams are, in one sense, very different, but on the other hand, they all contribute to the umbrella of knowledge that is necessary for us to really understand, "what is causing climate change?" and "what can we do about it?" This proves that ICP truly involves students in real research which attempts to find real solutions to

COLLEGE-BOUND ICP STUDENTS

ICP would like to take this opportunity to acknowledge our student researchers who will be attending college next semester. **Amelia Adams** will be attending Babson College on a full-tuition scholarship. **Mario Gonzales** will be attending State University of New York at Binghamton. **Marquise McGraw** will be attending Cornell University. He has received a number of scholarships, including the Ron Brown Scholarship and the Gates Millennium Scholarship. **Crissaris Sarnelli** will be attending Yale University this fall on a full scholarship. She has also received many scholarships, among them the United Federation of Teachers Award and the Gates Millennium Scholarship. **DeVoia Stewart**, who graduated top in her class at Frederick Douglass Academy, will be attending Georgetown University. She has received many scholarships, among them the Franklin Williams Scholarship and an award from the Omega Psi Psi Fraternity. **Jeff Waksman** will be attending Columbia University in the fall. The staff of ICP wish them all the best of luck in their future endeavors.

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We look forward to continuing to work with them on this project in the future.

From our perspective as students, we all realize, every single one of us, that this was not just any summer job. ICP was special to all of us. To each other, we are not just a sea of faces, but rather, we are a family. A family united in what we do – scientific research. A family whose members look out for each other, and provide support for one another. One girl told me that she was losing a friend of three years who had become a "sister" to her. It is this type of closely knit community that truly has the potential to make a substantial impact on the world, and to do great things within it. It is the individuals in this type of group that will become the leaders of tomorrow. It is this type of group that realizes that in the current state of affairs, educational programs are simply not appreciated, and it is up to each and every one of them to change that view, to make a decent education a right for all and not a privilege for just a few. I will conclude with something my friend Autumn Anderson told me. One night, Autumn said to me, "I wish school was more like ICP. Think about it. If we could study one subject intensively, do research, write papers, interact with our teachers and the experts in that field, school would be so much more interesting." Now I pose a question to all of the policy makers, CEOs of multibillion dollar corporations, heads of NASA who are responsible for this program, and academic leaders: What do you think you should do to make Autumn's vision a reality?

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This Week at ICP Summer Institute 2002
Second Issue

Brought to you by:

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And

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ICP Picture Moments

Jim Hartz, former NBC anchor and Author of Worlds Apart, addresses the ICP audience as part of the Science and Society Seminar Series. Hartz's talk was very inspiring, and students demonstrated an extraordinary amount of enthusiasm for his remarks. Hartz, here, is answering a question posed by ICP Research Student Leon Abbo.

Alumni of the ICP program all came on stage at the end of this year's Final Conference to surprise Director Carolyn Harris (next to podium) with some flowers and lots of hugs. ICP Alumni will never forget the impact that the program has had on them, and hope that the program can be continued so that more students can benefit.